



## M17 Agar Base w/o Lactose

M1019

On addition of lactose, this medium can be used for cultivation and isolation of lactic Streptococci from dairy products like yoghurt, cheese etc.

### Composition\*\*

Ingredients	Gms / Litre
Casein enzymic hydrolysate	5.000
Papaic digest of soyabean meal	5.000
Meat extract	5.000
Yeast extract	2.500
Ascorbic acid	0.500
Magnesium sulphate	0.250
Disodium - $\beta$ - glycerophosphate	19.000
Agar	11.000
Final pH ( at 25°C)	6.9±0.2

\*\*Formula adjusted, standardized to suit performance parameters

### Directions

Suspend 48.25 grams in 950 ml distilled water. Heat to boiling to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool to 45-50°C and aseptically add 50 ml of 10% w/v lactose solution sterilized separately by autoclaving at 15 lbs pressure (121°C) for 15 minutes or by filtration through a 0.2 $\mu$ m membrane filter. Mix well and dispense as desired.

### Principle And Interpretation

M17 agar is based on the formulation described by Terzaghi and Sandine (1) for the cultivation and enumeration of lactic Streptococci and their bacteriophages.

Lactic Streptococci are nutritionally fastidious and require complex media for optimal growth (2, 3).

Casein enzymic hydrolysate, papaic digest of soyabean meal, yeast extract, meat extract provide carbonaceous, nitrogenous compounds, vitamin B complex and other essential growth factors. Lactose is the fermentable carbohydrate. Ascorbic acid is stimulatory for the growth of lactic Streptococci. Magnesium sulphate provides essential ions to the organisms. Disodium  $\beta$ -glycerophosphate maintains the pH about 5.7 due to its buffering action.

Shankar and Davies (4) reported isolation and enumeration of *Streptococcus thermophilus* from yoghurt. Disodium glycerophosphate suppresses *Lactobacillus bulgaricus*. This medium is a standard medium for isolating lactic streptococci (5). M17 Agar is recommended by the International Dairy Federation (6) and ISO Committee (7) for selective enumeration of *Streptococcus thermophilus* from yoghurt. It is also suitable for cultivation and maintenance of starter cultures for cheese and yoghurt manufacturing.

### Quality Control

#### Appearance

Cream to light yellow homogeneous free flowing powder

#### Gelling

Firm, comparable with 1.1% Agar gel.

#### Colour and Clarity of prepared medium

Light yellow coloured clear to slightly opalescent gel forms in Petri plates

#### Reaction

Reaction of 4.83% w/v aqueous solution at 25°C. pH : 6.9±0.2

#### pH

6.70-7.10

### Cultural Response

M1019: Cultural characteristics observed after an incubation at 35-37°C for 24-48 hours.

Organism	Inoculum (CFU)	Growth	Recovery
<b>Cultural Response</b>			
<i>Enterococcus faecalis</i> ATCC 29212	50-100	good-luxuriant	>=50%
<i>Lactobacillus bulgaricus</i> ATCC 11842	50-100	none-poor	<=10%
<i>Lactobacillus leichmannii</i> ATCC 4797	50-100	good-luxuriant	>=50%
<i>Lactobacillus plantarum</i> ATCC 8014	50-100	good-luxuriant	>=50%
<i>Streptococcus thermophilus</i> ATCC 14485	50-100	good-luxuriant	>=50%

### Storage and Shelf Life

Store below 30°C in tightly closed container and the prepared medium at 2 - 8°C. Use before expiry date on the label.

### Reference

- 1.Terzaghi B.E. and Sandine W.E., 1975, Appl. Microbiol., 29:807.
- 2.Anderson A.W. and Elliker P.R., 1953, J. Dairy Sci., 36:161.
- 3.Reiter B. and Oran J.D., 1962, J. Dairy Res., 29:63.
- 4.Shankar P.A. and Davies F.L., 1977, Soc. Dairy Technol., 30:28.
- 5.Downes F.P and Ito k. (Eds), 2001, Compendium of Methods for Microbiological Examination of Food, 4th Ed. APHA, Washington, D.C.
- 6.International Dairy Federation, 1981, Joint IDF/ISO/AOAC Group E44.
- 7.International Organization for Standardization, 1985, ISO/DIS: 7889.

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